Biological Sciences
111 Research Drive • Bethlehem, PA 18015 • 610-758-3680
LEHIGH UNIVERSITY

Greetings from the department

It is relatively easy to walk around this department and find the many ways we have been "transformed." We have extraordinary computer-enhanced technology that gives our undergraduate and graduate students the critical tools needed once they graduate. We are transforming our curriculum with inquiry-based courses and faculty-student research opportunities that give our students not only an understanding of important biological issues, but also how to think about these issues.

Murray Itzkowitz, Ph.D.
Professor and Chair

However, in my opinion, the most dramatically transforming feature at Lehigh and in this department is the admission of undergraduate women forty years ago. The changes in Lehigh's culture and the intellectual climate because of the addition of women undergraduates continue to benefit everyone at Lehigh. Of course we need to celebrate!

And this department's celebratory event was to bring back six women who graduated with degrees in biology. As you will see on the subsequent pages, these women graduated at different times over the past 40 years and each one is certainly successful. We asked them to form a panel and offer a large group of Lehigh undergraduates their wisdom. I, as the moderator, worried that I needed to come prepared with a host of questions to make sure they had something to talk about. Well, I asked one question. Total! For the next ninety minutes these alums gave serious, well-intentioned, important, and amusing advice on how to receive the best education at Lehigh and how it can relate to their careers.

It will be fascinating to see the impact of our undergraduates on society over the course of the next 40 years. These are exciting times in the department of biological sciences! We hope you share our excitement.

Murray Itzkowitz, Ph.D.
Professor and Chair

Graduate Student Spotlight

Victoria Caruso Silva is a Ph.D. Candidate in the Cell and Molecular Biology program.

Victoria came to Lehigh after earning a Bachelor of Science in Biology from Seton Hall University and after working for Sanofi-Aventis where she spent two years studying cellular responses to pharmaceuticals being developed. It was during this time that Victoria became fascinated by a single cell's ability to respond to novel chemicals and came to appreciate how remarkable cells are. The great allure of cells prompted her to enter the graduate program in Fall of 2008 and to join the lab of Lynne Cassimeris.

Victoria Caruso Silva
Graduate Student

The Cassimeris lab has been interested in the microtubule cytoskeleton and its role in cell division. Recently it was discovered that the protein stathmin, which negatively regulates microtubule growth and longevity, is also necessary for proper cell cycle progression in certain cancerous cells.

Over half of all cancers lack a functional form of p53, a protein crucial to monitoring and responding to cellular damage. Without this 'gatekeeper' protein, cells with DNA mutations can continue to replicate, perpetuating their mistakes and giving rise to drastically altered cells that no longer respond to environmental signals. These cells are able to outgrow their normal tissue environment and metastasize to other regions of the body and destroy normal tissue. Recent research from the Cassimeris lab has demonstrated that cells lacking p53 can be controlled by the level of stathmin they contain. Lowering the level of stathmin in these cells regulates their proliferation rate and induces death.

Victoria's dissertation research has focused on investigating this novel observation and her work has established that these cells spend more time in interphase. Her work has identified key enzymes that are less active and likely responsible for this unique cell cycle delay. Victoria's continuing research will investigate the mechanism(s) behind why these enzymes are less active. Understanding why and how loss of a microtubule regulator causes slowed proliferation and increased cell death in many cancer cells could uncover new therapeutic targets to slow and/or eliminate tumor growth in patients.

When not in the lab, Victoria has spent the past two years bringing science and research into the middle school classroom. Through a grant funded by the National Science Foundation and Lehigh Valley S.T.E.M. (Science Technology Engineering and Mathematics), Victoria has worked closely with South Mountain Middle School where she co-taught sixth grade science classes one day a week with Alison Houpt, a devoted educator and inspiring mentor. During her time at South Mountain, Victoria helped 12 sixth grade honors students submit research projects to the Lehigh Valley Science and Engineering Fair where her students earned two 1st place, two 2nd place and an honorable mention award. She also designed and taught interactive lessons on topics such as the origin of life on earth, how the tongue relays taste information to the brain and the cellular basis of cancer, all adapted for a middle school audience.

Victoria has been the recipient of the Lehigh University Fellowship as well as the LV S.T.E.M Fellowship (2009-2011) from the National Science Foundation. Her work has been presented at national conferences and published in peer-reviewed journals.

Department welcomes newest faculty member

The department of biological sciences is pleased to introduce our newest assistant professor, Amber Rice, Ph.D. Amber received her undergraduate degree in Biology from the College of Wooster in 2001. After spending a year as a substitute teacher, Amber moved to Chapel Hill, NC where she obtained her Ph.D. from the University of North Carolina in 2008. From there, she headed to Uppsala University in Sweden, where she worked as a postdoctoral researcher for two and a half years. Dr. Rice moved back to North Carolina for a short postdoc from January to July of 2011, before moving to Bethlehem to join the faculty at Lehigh in the fall.

Amber Rice, Ph.D.
Evolutionary Biologist

Rice is an evolutionary biologist. Her research focuses on the roles of species interactions, such as competition and hybridization, in speciation. Dr. Rice uses a combination of ecological field studies and genetic analyses in her work. She has worked with a variety of species during her career, including wild radish, wolf spiders, red snapper, spadefoot toads, and flycatchers. Her current projects focus on the early stages of speciation in spadefoot toads and the late stages of speciation in several hybridizing bird species. Dr. Rice already has two Lehigh undergraduates doing research in her lab, and this summer, she plans to involve Lehigh students in field research with local populations of chickadees.

Ware promoted to full professor

In May, 2011, Vassic Ware, Ph.D. was elevated to the rank of full professor by the university's board of trustees. This brings the number of full professors in the department to twelve.

Ware earned her bachelor's degree from Brown University in 1975. She then went on to Yale University where she was awarded a master's degree ('78) and Ph.D. ('81). Ware then returned to Brown as a postdoctoral research fellow.

Vassie Ware, Ph.D.
Professor

Beginning her career at Lehigh in 1985, Dr. Ware served as chair of the Department of Molecular Biology ('94-95), prior to the department merging to become Biological Sciences, and interim chair of the newly created department ('96). She has been the co-coordinator (with Prof. Kuchka) of the department's distance education program, as well as serving on the department's graduate committee.

Professor Ware is also co-director (with Prof. Neal Simon) of the university's 2006 and 2010 grants from the Howard Hughes Medical Institute (HHMI), both of which aim to boost interdisciplinary research and educational opportunities for students.

In 2009, Ware was instrumental in working with HHMI to lead the Lehigh in the SEA (Science Education Alliance) class. This lab instructional opportunity provides a research experience to undergraduate novices at early states in their academic careers, giving them a real taste of experimental science. She is currently developing curricula to make this class a permanent addition to the department's offerings.

The research in the Ware Laboratory is centered on understanding the molecular biology of ribosome biogenesis in eukaryotes. Using molecular, genetic and biochemical approaches, Ware studies several post-transcriptional events in ribosome maturation, including rRNA-ribosomal protein interactions, rRNA processing, and ribosomal subunit transport.

2011 Fast Facts

- Ten graduate students received their M.S. in Molecular Biology through the university's distance education program
- 64 undergraduate students received their degree in one of the biological sciences

Bachelor of Arts
- Behavioral Neuroscience - 8
- Biology – 7

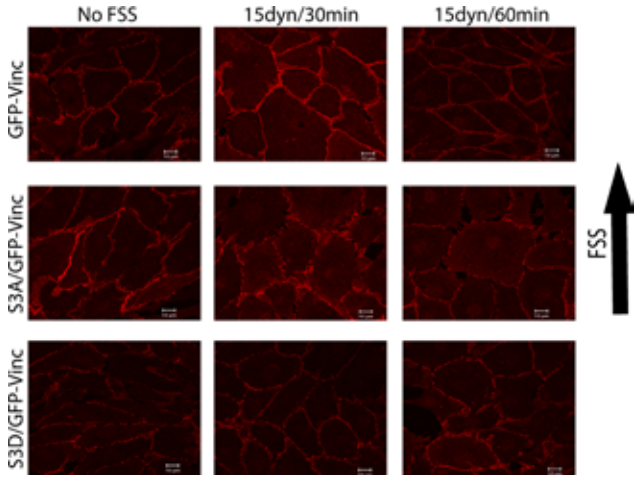
Bachelor of Science
- Behavioral Neuroscience – 17
- Biochemistry – 9
- Biology – 20
- Molecular Biology - 3

Biological Sciences
299 majors
61% female
39% male

2011 Doctoral Degree awarded

Doctor of Philosophy
Molecular Biology

Bruce Carney
Life needs a little instability: stathmin depletion from cells lacking p53 leads to delayed cell cycle progression and apoptosis due to increased microtubule stabiity



Endothelial cells (BAECs) expressing control genes (GFP-Vinc) alone (top panels) or GFP-Vinc in combination with a constitutively active (S3A) cofilin mutant (middle panels) or a constitutively inactive (S3D) cofilin mutant (bottom panels) were exposed to fluid shear stress (FSS) and stained with antibodies for vascular endothelial cadherin (VE-cadherin), a protein in cell-cell junctions. Under control conditions, barrier integrity is strengthened during FSS (continuous staining – top panel). Both cofilin mutants disrupt the ability of the cell to regulate cofilin activity which leads to disruption of the actin cytoskeleton in response to FSS (gaps in the cell-cell adhesion staining in the middle and bottom panels). Slee, J., Lowe-Krentz Lab

Celebrating 40 years of women undergraduates

The department joined in the university-wide celebration of the 40th anniversary of undergraduate women at Lehigh. On September 29th we were honored to welcome six of our distinguished alumni for a career panel discussion. Those in attendance heard about the career paths that each of the following women embarked upon after they received their degrees from Lehigh.

Kelly (Buller) Close, MD, MPH '91

Physician, Executive Director
Major: Biology

Dr. Close received her Master's of Public Health in Health Policy and Management with honors from Yale University, during which time she also received the Yale University President's Award and the Yale School of Medicine Martin Luther King Award. She then was awarded a medical degree from the University of Pittsburgh, and completed her residency in emergency medicine at the University of Pittsburgh Affiliated Residency in Emergency Medicine. Currently, Kelly is responsible for the overall financial, programmatic, and administrative operations of Emed Health. Her experiences include serving as the Executive Director and founder of a Prenatal and Well-Child Care management program which received the President of the United States Service Award at the White House in 1996. Dr. Close also served for three years as the National Coordinator of Disaster Volunteers for the American Red Cross. In addition to this role, she was an advisor to the President of the Red Cross on medical teams and weapons of mass destruction and terrorism.

Velma (Gebhard) Conway '75

Occupational Therapist
Majors: Biology & Psychology

After graduating in 1975, Ms. Conway went to the University of Pennsylvania, School of Allied Medical Professions (SAMP) which has since closed. She earned a Certificate in Occupational Therapy after a year of nine to five classes and an additional six months of internships. After sitting for the national registration exam in January of 1977 and passing, Velma worked as an on-call therapist and then a therapist in a nursing home before obtaining a full time position at the Robert Wood Johnson Rehabilitation Center attached to the JFK Medical Center in Edison, NJ. In 1992, Velma received a phone call from a local school district looking for an occupational therapist and she decided to reinvent herself as a school therapist. She has been doing school therapy for 19 years as an independent contractor.

Michelle Ferretti, MS, DPT '95

Physical Therapist
Major: Behavioral Neuroscience

After graduating from Lehigh, Dr. Ferretti worked in research labs at Children's Hospital Boston and the Dana Farber Cancer Institute. However, she craved a clinical setting with patient interaction. In 2000, Michelle received a Masters of Science in physical therapy from the Massachusetts Institute of Health Professions (IHP) in Boston, MA. After graduating from the IHP, she worked as a physical therapist at Children's Hospital Boston, in both the inpatient and outpatient settings. In 2002, MIchelle returned to the IHP part-time, and earned her doctorate in physical therapy. In 2007, she left Children's to work as a physical therapist at the Learning Center for the Deaf, a school for deaf children in Framingham, Massachusetts. She continues to work at Children's on a per diem basis, running a weekend clinic for children with various diagnoses. Over the past several years, Michelle has also taught multiple courses at the IHP, served as a clinical instructor and has spoken in various settings about the treatment of children with brachial plexus injuries.

Kara (Villamil) Gavin, M.S. '92

Director, Public Relations
Majors: Biology & Science Writing

As director of public relations at the University of Michigan Medical School, Kara Gavin oversees media relations and employee communications, and has the lead role for crisis and issue communications. She and her team create and distribute news about the discoveries made by the university's researchers, the advanced clinical care provided at the hospitals and health centers, and the education and training of thousands of medical students, residents and biomedical graduate students. Prior to becoming director in 2008, she was a science & medical writer and media relations team member for nine years. She went to Michigan in June 1999 after six years in public relations and employee communications at Brookhaven National Laboratory. At Brookhaven, she helped communicate about discoveries on topics that ranged from addiction and plant biology to alternative energy and particle physics. Gavin is a 1993 graduate of the Columbia University Graduate School of Journalism.

Marilyn Gorney-Daley, MD, MPH '88

Physician, Director
Major: Biology

Gorney-Daley received a medical degree from the University of Medicine and Dentistry of New Jersey, School of Osteopathic Medicine in 1993 and a Master in Public Health degree from the University of Medicine and Dentistry School of Public Health in 1995. Dr. Gorney-Daley is board certified in General Preventive Medicine and Public Health. Marilyn has been with the New Jersey Department of Health for approximately 15 years and currently serves as the Director of Special Child Health and Early Intervention Services at the State of New Jersey Department of Health where she oversees a number of programs and services for children with special health care needs. She is responsible for a staff of over 60 professionals with an annual budget of over 150 million dollars.

JoAn Monaco, MD, MS '93

Plastic, Reconstructive & Cosmetic Surgeon
Major: Behavioral Neuroscience

Dr. Monaco earned her medical degree from the University of Vermont College of Medicine and is the first female to graduate from the plastic surgery residency at the University of Kansas Medical Center. She was also awarded a two-year training fellowship at the National Institutes of Health where she conducted research in immunology and has presented her findings at numerous national and international meetings. After completing a six-year residency in plastic and reconstructive surgery she started a solo practice in New York City. Dr. Monaco has travelled to various third world countries for medical missions to repair cleft lips/palates, congenital anomalies and perform reconstructive surgeries for burn victims. She has also become a lead coordinator for "Doctors for the Cure" for the Susan G. Komen Foundation to allow doctors and their patients to become involved in educating and researching a cure for breast cancer.

Read more about Dr. Monaco on pages 4 & 5!

More than twenty years ago, a young woman attended her first lecture in Prof. Neal Simon's Drugs & Behavior class. The lecture was titled, "Sex 'n Drugs 'n Rock & Roll." Simon opened his lecture with the song, "I Want a New Drug," by Huey Lewis and the News. At the end of the lecture, this young student marched to the front of the lecture room and asked Dr. Simon if she could join his lab. Dr. Simon was honored by the student's request, but was hesitant to say "yes" because of other obligations. Eventually Simon agreed, which led to a mentoring relationship that happens only a handful of times in a career in academia.

From being in a lecture hall listening to Huey Lewis and the News, to performing miracles of medicine for countless individuals ….. JoAn Monaco shares with us how having a faculty mentor and a degree in the Biological Sciences can change a life.

JoAn MONACO, MD, MS '93, '94

JoAn Monaco currently lives in New York City where she is in solo practice as a plastic and reconstructive surgeon. She is also the Program Director for the Aesthetic Surgery Fellowship at Manhattan Eye, Ear and Throat Hospital of North Shore/LIJ/Lenox Hill Hospital. JoAn has been married to her husband, Mike, for seven years and they have a three-year old daughter, Caroline. Mike is the Director of Bladder and Testes Cancer at The Cancer Institute of New Jersey/Robert Wood Johnson University Hospital.

"I attended Lehigh University until 1994….which seems like an eternity ago! I earned a BA degree and a Masters of Science in Neuroscience in the five years that I studied at Lehigh. I also completed a French major as part of my undergraduate degree because I enjoyed the classes as a break from all the hard-core science that I had to take for pre-med requirements." Monaco notes that she attended Lehigh because her father is an aeronautical engineer and Lehigh's engineering is truly top-notch. "My dad has always hoped that one of his four children would follow in his footsteps and become an engineer, so Lehigh seemed like the perfect environment to do that. I think I might have disappointed my dad a little bit by instead becoming a plastic surgeon as I was his last hope for that dream! Maybe his grandkids will make it happen for him!"

After completing her graduate work at Lehigh, JoAn was awarded a two-year fellowship at the National Institutes of Health where she did HIV and AIDS research under Dr. Anthony Fauci. "It was an incredible fellowship as I was learning so much from the greatest minds in science on a day-to-day basis." It was during her time at the NIH when she decided to apply to medical school. "I knew that a life in a lab was not the right match for me," she noted.

Monaco was offered admission to six medical schools and chose the University of Vermont College of Medicine. "UVM was my first choice because it had a unique curriculum that compressed the basic sciences into 18 months instead of the traditional 24 months. This provided me six more months of clinical rotations to learn about different areas of medicine that I wouldn't otherwise get the chance to learn about like radiation oncology, emergency medicine, critical care, etc. I was also able to designate myself as a "surgery major" at UVM which meant I did extra rotations in transplant surgery and trauma which allowed me to take an advanced anatomy dissection lab where I had my own cadaver to work on for a semester to learn about anatomy in a level of detail that a surgeon needs to know....much more detail than the Gross Anatomy course that all med students have to take." JoAn did her residency in Kansas City, which was a six year integrated plastic surgery residency. The integrated plastics surgery program enabled her to go straight from medical school into plastic surgery training, instead of doing the traditional general surgery or ENT residency before plastics. "The integrated program saved three years of time on my training, which made sense to me. After completing residency, I then came home to New York to do a one year aesthetic surgery fellowship at Lenox Hill Hospital."

Dr. Monaco has traveled to the Dominican Republic to do cleft lip and palate repair on numerous children and teens in desperate need of these surgeries. Typically in the United States, cleft lips are repaired when children are infants. In the Dominican Republic, like so many other third world countries, it takes years for families to get hooked up with a mission team for a much needed surgery like this. Some of her patients were teenagers getting their lips repaired for the first time. She has also cared for many burn victims who never received treatment after a burn, which is crucial to maintaining full range of motion of hands, arms, the neck, etc. "It is common practice in the Dominican to place battery acid and coca cola syrup into a light bulb and do drive-by attacks where light bulbs are thrown on innocent teens. The battery acid would cause the burn and the coca cola syrup would make the acid stick to the skin.

(left) The hallway where patients line up each morning to wait and see if they are appropriate candidates to have surgery later that same day. The hallway was always packed and many patients even brought gifts of fruits, thinking it would influence the medical team to operate on them. (middle left) Dr. Monaco holding an 18 month old girl for whom she later performed a cleft lip repair. (middle right) Dr. Monaco performing a cleft palate repair on a five year old boy. (right) A compelling photo that illustrates light bulb acid burns *(photos courtesy of JoAn Monaco, from her work in the Dominican Republic)*

The light bulb would shatter into thousands of tiny shards, which penetrate the skin and allows the battery acid to worsen the burn while preventing anyone from trying to brush off the acid from the skin. It was devastating to see these victims who had burns of the face and neck to the point where they could not rotate their neck or hold their heads up straight. Teen girls would bring pictures of their beautiful faces and beg the mission team to help them look like themselves again. It is truly heart-breaking."

JoAn has had some very close personal experiences with women affected by breast cancer which led to her involvement with Susan G. Komen Race for the Cure Foundation. She sponsored a team in the New York City Komen Race for the Cure and is part of the "Doctors for the Cure" initiative. She hopes to dedicate more of her practice to helping reconstruct women with breast cancer as her practice evolves.

We thank Dr. Monaco for taking time out of her busy schedule to share her professional journey and answer our questions.

Q & A's with JoAn Monaco

How was a Lehigh education for you different than what you saw when you visited with us in the fall of 2011?

The campus was so impressive with so many new buildings. It seems like there are so many more students than when I was there. I was truly impressed by the new look of the campus but what I appreciated most was sitting down with my undergrad and graduate advisor, Dr. Neal Simon. He sat me down in his office, across from his still-messy desk, and we caught up on everything from the past decade about his work, his lovely wife, Sue and his kid's accomplishments…. It's great that the most important things never change as I wouldn't be where I am today without having a mentor in Dr. Simon. I also reminded him how he refused to be my adviser, which gave us both a laugh.

Hands-on lab experience is a strong component of our curriculum today, both through our instructional lab classes, as well as individual research with faculty mentors. We know you were involved in research in Dr. Simon's lab. Can you share how this had an influence on you – both while at Lehigh and later in medical school and in your career?

I think lab experience is tremendously important for critical thinking. I spent so much time in med school memorizing information for exams and this is a terrible way of learning and understanding. But, lab time is important for learning how to think, how to interpret results and how to crucially understand an experiment from start to finish. My research time was very worthwhile for learning how to read scientific journals and understand the elements of a quality study/publication versus a poorly written article. At Lehigh, I gained the skills that I needed for my fellowship at the NIH where I worked in P3 security level labs on HIV viruses that were thousands of times more virulent than HIV found in blood. I don't think I would have had the confidence to work with such infectious material if I didn't have solid training from Dr. Simon at Lehigh. He also paired me with a couple of trauma surgeons from Lehigh Valley Hospital which sparked my interest in surgery while doing their cytokine research.

Looking back at your Lehigh career, is there any advice you can give to today's generation of Lehigh students?

I really made the most of my time at Lehigh and I think that's crucial for any Lehigh student. I spent a great deal of time doing community outreach work through my sorority as well as holding leadership roles on campus with various organizations. I fit in a French major with my science studies simply because it was fun and I spent a lot of fun weekends on the hill with my friends when I wasn't bartending at the Ho. I look back to my time at Lehigh as great fun because I was learning a great deal from my classes and through my research and made a lifelong mentor and friends along the way. I found balance with trying to keep a high GPA with extra-curricular activities that med schools like to see. Now, being a business owner, I wish I had taken some business classes, which would have been helpful but, otherwise, I'm glad I spread myself thin while at Lehigh because I feel like I made the most of those years….I recommend that current Lehigh students make the most of their time as an undergrad, find balance while working on a high GPA if considering a graduate degree of some sort.

Is there any specific advice you can give our educators to better prepare their students for their careers?

I learned the most from smaller classes over those huge "Intro to Whatever Courses" because they permitted interaction with other students and professors in a way that shaped critical thinking. The professors who I still think of fondly had an open door policy with frequent office hours and always made themselves accessible to students, which was extremely worthwhile. When I toured the labs on my return visit, the same professors who always had their offices open for student visits still had their doors open a decade later. This was incredible to see.

Early in her career as a faculty member and researcher at Lehigh, Jill Schneider, Ph.D. recognized something special in an undergraduate student. When a request was sent out to the department requesting suggestions of successful women alumni to highlight in our annual newsletter, we received an immediate response from Professor Schneider.

MYLA D. GOLDMAN, MD '94

Myla Goldman earned her bachelor of arts degree in Behavioral Neuroscience from Lehigh in 1994. She remained at Lehigh for another year as a lab technician for the Schneider Lab. Myla entered the MD program at Rush Medical College in Chicago. Following medical school, Dr. Goldman continued her education with an internship at Rush Presbyterian-St. Luke's Hospital in Chicago and residency at University of Virginia. In 2002 Goldman became a Multiple Sclerosis elective resident at University of California San Franciso, followed by a neuroimmunology fellowship at the Cleveland Clinic Foundation. Since 2006 Dr. Goldman has been an assistant professor in the department of neurology at the University of Virginia, serving as chief of the MS/Neuroimmunology division and director of their fellowship training program. Dr. Goldman graciously responded to our request to answer a few questions.

Why did you attend Lehigh University?

I was looking for a school that was of a smaller size. I had a friend recommend Lehigh to me. When I visited, I was taken by the beauty of the campus and the area. At the time, there were not many established Neuroscience programs. I really liked that Lehigh had a dedicated program in Neuroscience.

After my first year, I was thinking of transferring to another school. It was harder to be so far from my family (in Chicago) than I thought it would be. However, during my sophomore year, John Nyby recommended I work with Dr. Jill Schneider to get some lab experience. This opportunity became critical in my development. Dr. Schneider's mentorship kept me at Lehigh and laid the foundation for my research career.

Please describe your research.

I am currently funded by an NIH NINDS mentored patient-oriented research grant (K-23) in the area of multiple sclerosis (MS). This project, entitled, "Validation of a motor fatigue measure in multiple sclerosis" is a 2 year longitudinal study of outcome measures of MS-related motor fatigue and ambulation impairment. This specific project focuses on the validation of the 6-minute walk by assessing three important aspects of 6MW validity- criterion validity, potential confounders, and sensitivity of the measure over time. In addition to having a tool to adequately test therapies for MS-related motor fatigue, this work will expand our understanding of motor fatigue, by studying its relationship to disability, subjective fatigue measures, cardiac fitness, and disease progression over time. This K-23 research project will confirm and extend my previous work validating the 6MW, which is a reliable, accessible, inexpensive, and promising outcome measure. My immediate career interests lie in the validation of the optimal outcome measure for ambulation in MS, which can be used to design therapeutic trials of this disabling and ubiquitous aspect of MS disability and progression. My long-term career goal is to become a leader in MS clinical research, with specific expertise in outcome measures and MS therapeutic trial design and execution.

Hands-on lab experience is a strong component of our curriculum today, both through our instructional lab classes, as well as individual research with faculty mentors. Can you share how this had an influence on you – both while at Lehigh and later in medical school and in your career?

I began my research career while completing my undergraduate degree in Behavioral Neuroscience at Lehigh University. I spent a total of 4.5 years working in Dr. Jill Schneider's laboratory studying the relationship between metabolism and estrus cycles in a Syrian hamster model. My three years of mentored lab work culminated in an Honor's Thesis that was presented in 1994 at the completion of my degree. This work was presented as a poster presentation and included as part of a larger publication in the *American Journal of Physiology*. I spent an additional year working full-time in Dr. Schneider's laboratory and continued to work during the first two summers of medical school. My post-graduate research was published in *Hormones and Behavior*. These experiences laid the foundation for my critical thinking and interest in neuroscience research. I attended medical school with plans to pursue patient-centered research.

The value of my experiences with Dr. Schneider's lab was not about the specific research question or animal model, as I went on to do clinical research. But more generally- it provided me with mentored experience in developing a research question, executing a scientifically sound research protocol, and learning how to write/communicate my research findings. For example, I had the opportunity to present my research at regional and national meetings. This provided me with experience in articulating my research and networking with others. Finally, working with a scientist who was a mother- provided me with a model for true life balance. Dr. Schneider is an outstanding and relevant example of how to be successful both professionally and personally. This is something that all young scientists need to learn- Life/Work Balance.

Looking back, is there any advice you can give to today's generation of Lehigh students?

The best advice I can give is to talk to as many people as possible about your potential career goals. Talk to people doing what you want to do. Talk to people who decided not to do what you want to do. And any other variation. I have always found it helpful to hear about the journey's taken by others to help me find my best path forward.

Be open to opportunities that may not have direct or linear benefit to your life plan. My research with Syrian Hamsters did not directly translate to a research career – in terms of the animal model or research questions. However, it did inform my research career by giving me the fundamental tools need to be a good scientist. These are universal and not directly tied to the lab or research that you do early in your career.

Is there any specific advice you can give our educators to better prepare their students for their careers?

When mentoring students, I will really question them and listen to what their likes/dislikes are professionally and what is important to them personally. When able, I also observe what they uniquely excel at and enjoy most. The right path is not always the most obvious or most often traveled. It is important to help students avoid the trappings of others expectations (even your own). Without this, they may go down a road that will prove to be professionally or personally disappointing.

2011 Publications

Bold = **Faculty**
Bold+Italics=***Graduate Student***
Italics = Undergraduate Student
Underline=Former/Current Student

Phopin, K., Nimlamool, W., *Bartlett, M.,* **Bean, B.** 2011 Distribution, Cryptic-ity, Stability, and Localization of -L-Fucosidase of Mouse Cauda Epididymal Sperm. Mol. Reprod. Dev. 79:08-217.

Behe, M. J., 2011 The Limits of Non-Intelligent Explanations in Molecular Biology, Ch. 19, pp. 429-442, in The Nature of Nature: Examining the Role of Naturalism in Science, edited by B. L. Gordon and W. A. Dembski. ISI Books, Wilmington, DE.

Coleman, W.L., ***Fischl, M.J., Weimann, S.R.***, and **Burger, R.M.** (2011) GABAergic and glycinergic inhibition modulate monaural auditory response properties in the avian superior olivary nucleus. The Journal of Neurophysiology, May; 105(5):2405-20.

Cundall, D. and Pattishall, A. 2011. Foraging time investment in an urban population of watersnakes (Nerodia sipedon). J. Herpetol. 45, 174-177.

Wang, S., **Falk, M.M.**, Rashad, A., Saad, M.M., Marques, A.C., Almeida, R.M., Marei, M.K., and Jain, H. 2011. Evaluation of 3D nano-macro porous bioactive glass scaffold for hard tissue engineering. J. Mater. Sci: Mater. Med. 22:1195-1203.

Gumm, J., Snekser, J., Leese, J. M., ***Little, K.,*** Leese, J., ***Imhoff, V.E.***, Westrick, B. & **Itzkowitz, M.** 2011. Management of interactions between endangered species using habitat restoration. Biological Conservation. 144:2171-2176.

Sie, C.P. and **Kuchka, M**. (2011) RNA editing adds flavor to complexity. Biochemistry (Moscow), 76(8): 969 - 881.

Mengistu, M., *Brotzman, H.*, Ghadiali, S., and **Lowe-Krentz, L.J.** 2011. Fluid shear stress-induced JNK activity leads to actin remodeling for cell alignment. J. Cellular Physiology, 226(1):110-121.

Rice, A. M., Rudh, A., Ellegren, H., & Qvarnström, A. (2011). A guide to the genomics of ecological speciation in natural animal populations. Ecology letters, 14(1), 9-18. doi:10.1111/j.1461-0248.2010.01546.x

Klingerman, C. M., Williams, W. P. III, Simberlund, J., Brahme, N., Prasad, A, **Schneider, J. E.** and Kriegsfeld, L. J. Food restriction-induced changes in gonadotropin-inhibiting hormone cells are associated with changes in sexual motivation and food hoarding, but not sexual performance and food intake. Frontiers in Endocrinology, 201:1-15, 2011.

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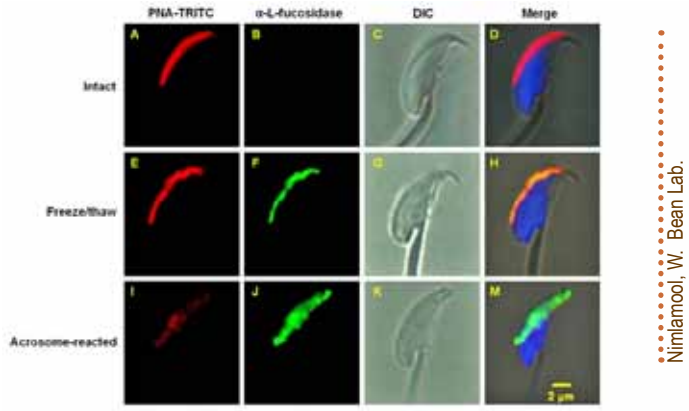

Alpha-L-fucosidase at the acrosomal area of mouse sperm and its relocalization at the Equatorial segment after the acrosome reaction

Alumni Updates

Undergraduate

Jarrod Kaufman (Biology, 1992) is a general and advanced laparoscopic surgeon in Freehold, New Jersey. Jarrod is also the NJ State Chair for the Commission on Cancer of the American College of Surgeons. In addition, Jarrod serves on the governor's task force on Cancer Prevention, Early Detection & Treatment.

Arthur Beauregard (Mol. Bio., 2000**)** earned his Ph.D. in biomedical sciences from the University of Albany in 2009. He is currently a consulting scientist in the School of Public Health at Albany.

Laura Buddemeyer (Biology, 2002) received a commission from the Lehigh University ROTC program and served as an Army officer for over eight years, including multiple tours in Iraq. Laura separated from the Army in 2011 and entered the University of Kansas School of Nursing program. Her goal is to work in cricital care and ultimately become a certified registered nurse anesthetist.

Three former undergraduate researchers from the Falk Lab are pursuing their graduate degrees! **Robert Buckheit** (Mol. Bio, 2009) and **Joseph Varco** (Biology, 2009) are in the graduate program at Johns Hopkins University. **Jonathan Havel** (Biochem, 2006) is studying at Emory University.

Steve Hesler (Biochem, 2011) began work at Eli Lilly in Indianapolis, Indiana. "They picked me as one of seven people interviewed for 2 positions, which shows how competitive Lehigh is!"

Graduate

John Leiser, Ph.D. (Integrative Biology, 2003) was named the Pennsylvania Professor of the Year by the Carnegie Foundation for the Advancement of Teaching. John is an associate professor at Northampton County Community College. Leiser's research interests center around the study of wildlife biology, behavioral ecology, and fish biology. Murray Itzkowitz was John's research adviser at Lehigh. John began teaching at NCC as an adjunct professor on the main campus during the spring 2002 semester. In 2004, he was hired into a tenure track position as an assistant professor at the Monroe campus.

Diane Dutt (M.S., Mol. Bio., 1994; Ph.D., Mol. Bio., 2002) is currently a federal employee working for the Defense Threat Reduction Agency (DTRA) at Fort Belvoir, Virginia. "My current position is that of Senior Project Manager for the Transitional Medical Technologies Intiative (TMTI). The focus of my work is to identify, select, manage funding and oversee the progress of research projects that support the TMTI mission. Our mission is to develop and coordinate a rapid response to emerging and conventional bacterial and viral pathogens. The work is interesting as I have the opportunity to interact with those at the forefront of biotechnology development and look for upcoming researchers in the academic arena worldwide."

William Coleman (Ph.D., Mol. Bio., 2009), began his position as a tenure-track assistant professor at Bloomsburg University in August, 2011.

Special topics students publish findings

In the Fall of 2011, Professor Lynne Cassimeris led a special topics course with 3 graduate and 2 undergraduate students. The result of the class was a published paper with all students as co-authors. We asked Dr. Cassimeris and the students to share their experience with you.

To Dr. Cassimeris: We hear you taught an unusual course in the fall of 2011. What did you do?

I offered a special topics course at the undergraduate and graduate level. Five students (2 undergrads, 3 grads) were brave enough to register. We worked as a team to research a hypothesis linking two areas in cell biology that aren't usually linked together. In a nutshell, we explored whether the internal skeleton of the cell, the microtubules, regulates multiple steps in intracellular metabolism. We researched each metabolic step and possible microtubule regulation and found plenty of evidence to support the hypothesis. We then wrote a manuscript reviewing the literature and proposing our hypothesis. Each student wrote and revised a section of the manuscript and I then combined all the sections, added introductory and concluding sections, checked all the facts cited by the students and revised the writing to have one voice throughout. We submitted the manuscript right after the Thanksgiving break and finally received three reviewers comments and a summary letter from the journal editor in late December. The students worked over the Christmas break to revise the manuscript, as suggested by the anonymous reviewers.

How did the students respond to the peer review process?

Two of the reviews were very positive and suggested very minor changes to improve the writing. But there's always a third reviewer, and he/she had more critical comments that made us re-think a paragraph or two. I think the students were a bit surprised by this more critical review. It was a good experience for all of them.

Was your manuscript accepted?

Yes, it was accepted in January and just came out in the journal *Cytoskeleton* in March (volume 69, No. 3, 2012). The publisher generously provided each student with their own copy of this issue of the journal.

To the Students: Dr. Cassimeris told us about the course you took in the fall of 2011. How did you find the experience?

Victoria Caruso Silva (graduate student): I really enjoyed the class. Our research topic was particularly interesting and we all worked well as a team. In the end it was both exciting and gratifying to have our efforts result in a publication.

Quynh Ton (graduate student): The class provided me an excellent experience. I learned how to write a paper efficiently enough so that we could get it accepted for publication and learned how to prepare for the process of publication. It was a good class, I got a chance to review my knowledge about biochemistry and got a chance to learn new topics.

John Fong (graduate student): That was a unique learning experience that I wouldn't normally receive in a regular classroom setting. Through the course, I had the opportunity to practice scientific writing and publication processing. The skills and knowledge that I learned from the course are very important for my professional development. Those skill sets will serve me well for the rest of my scientific career.

Cody Molnar (Undergrad Class of '12): Wonderful! I thought it was a very valuable experience.

Elizabeth Miller (Undergrad Class of '12): The course was unlike any other class I have taken at Lehigh University. Dr. Cassimeris taught me how to synthesize ideas pertaining to the field of biology rather than simply memorizing information. Through the experience, I learned how to independently analyze information and discuss information cooperatively with a group. Additionally, she gave me experience in how articles in science are written, proofread, submitted, and finally, published. This was a novel course that I think every science student should experience!

And now we'd like to hear from you!

Please take a moment to update us on your activities.

Name:_____ Year(s) of Lehigh degree(s)_____

e-mail address: _____

News about you and your professional work: _____

_____

_____

_____

Want to visit?

Would you like to see for yourself how the department has grown? We would love to welcome you back for a visit! Simply call Vicki Waldron (610-758-3680) to make arrangements and we'll make sure someone is available to give you a personal tour!

Please send to: e-mail: inbios@lehigh.edu

-or- fax: 610-758-4004

-or- Department of Biological Sciences
Alumni News
111 Research Dr., B217
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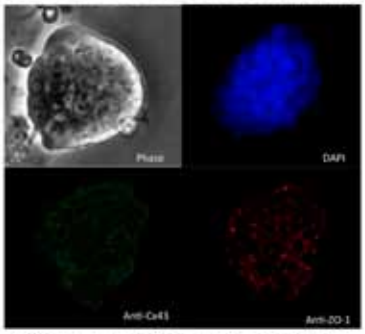
ES Cells and cell-to-cell communication



A colony of mouse embryonic stem cells stained for gap junction protein (Cx43) and zonula occudens 1 (ZO-1). John T. Fong (PhD candidate) from Dr. Falk's lab